THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 19. MAY 12, 1951 VOL. 63.

STUDIES IN TUBERCULOSIS SENSITIVITY IN THE PIG

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INTRODUCTION

Sensitivity in the pig as a result of infection with the bacillus of tuberculosis has received very little attention from research workers. Reports in the literature deal mainly with the types of infection found in pigs and with descriptions of testing techniques employed.

Most writers prefer to use the fold of skin at the base of the ear as being accessible and reactions at this site are easier to read. There is no general agreement as to the time after injection for reading the test. Little information is available as to the best type of tuberculin nor have any studies been reported as to the optimum tuberculoprotein content of the tuberculin for the pig. Most workers have used the same type of tuberculin as is used in cattle, but no comparative tests with different strengths of tuberculin have been reported; there is, however, undoubted evidence that the pig may become sensitised to either the bovine or the avian type of bacillus or to both.

The work of Arthur (1946) and the investigations reported by Kerr, Lamont and McGirr (1946 and 1948) of this laboratory have focused attention on the lymphocyte polymorphonuclear leucocyte ratio in sensitised animals subjected to an injection of tuberculin. This and the wider aspect of sensitivity and desensitisation in general envisaged by their work have prompted a similar line of enquiry in the pig.

THE BLOOD PICTURE IN THE NORMAL PIG

A series of 110 bloods from normal pigs was examined to establish the range for total white cells and for the differential leucocyte count. In the latter count the percentage and absolute number of lymphocytes, polymorphonuclears and eosinophils were calculated.

The series of 110 bloods comprised 30 bacon pigs, 30 sows and 50 pigs within the age range eight to 16 weeks. The blood samples from the sows and bacon pigs were collected at Belfast Abattoir. These samples were taken between 10 to 11 a.m., the pigs having been rested and fasted overnight.

In the case of the eight- to 16-week-old pigs these samples were collected on various occasions from the laboratory herd. This group comprises 20 pigs bled at 11 a.m. and 30 pigs bled at 4 p.m. The morning group were bled two to three hours after feeding, while the afternoon group were bled before feeding.

The ages of the sows were unknown, but it is unlikely that they were under three years old, and most of them were animals which had proved unsatisfactory as breeders. In this group the total white cell count varied from 10,200 to 25,550 cells per ml. with an average over the 30 specimens of 15,900. With one exception the total polymorphonuclear leucocytes were less than the total lymphocytes. The total polymorphonuclears varied from 4,840 to 9,500 per ml. with an average of 5,593. The total lymphocytes varied from 7,010 to 15,150 with an average of 9,974. The exception noted was a sow which showed 55·5 per cent. polymorphonuclears to 44 per cent. lymphocytes. The eosinophil count over 200 cells varied from zero up to 10 per cent. with an average of just over 2 per cent. Five out of the 30 sows showed no eosinophils in the 200 cells counted.

A series of blood samples from bacon pigs were also examined. These pigs would be about eight to nine months old. Total white cells in this series varied from 10,000 to 21,350 per ml. with an average of 13,747. Polymorphonuclears varied from 1,900 up to 6,660 with an average of 3,857. Lymphocytes had a range of 5,410 up to 16,800 with an average of 9,672. Eosinophils varied from zero up to 8 per cent. averaging just over 1 per cent. Nine of the bacon pigs showed no eosinophils in the 200 cells counted.

Fifty blood samples from pigs eight to 16 weeks were examined. These were divided into two lots—20 being bled in the afternoon and 30 bled in the morning. The 20 samples taken at 4 p.m. gave an average total white cell count of 19,150 with a variation in individual cases of from 13,200 up to 35,400 per ml. Polymorphonuclears varied from 2,800 up to 9,140 with an average of 4,869. Lymphocytes averaged 13,810, varying from 7,200 up to 28,450. Eosinophils varied from zero up to 6 per cent. averaging 1·9 per cent. In only one pig in this group were no eosinophils recorded over 200 cells counted.

Among the 30 pigs of the group bled at 11 a.m. total white cells counts averaged 30,666, varying from 20,500 to 43,250 per ml. Polymorphonuclears ranged from 6,150 up to 17,640, averaging 11,132 per ml. Lymphocytes averaged 18,850, ranging from 12,680 up to 26,800 per ml. Eosinophils averaged 1·6 per cent., varying in different animals from zero up to 6 per cent. No eosinophils in 200 cells was the finding in five animals in this group.

The ranges of variation in the cell counts for total white cells, polymorphonuclears and lymphocytes are comparable between the sow and bacon pig groups. In the store pigs (eight to 16 weeks old) the total white cell count is higher compared with the older pigs and within this group the morning bleeding gave an average total white cell count of 30,666 as compared with an average of 19,150 for the afternoon bleeding. It is interesting to note that the average polymorphonuclear percentage of the morning samples was 36, whereas this figure fell to 25 per cent. in the afternoon bleedings. There was a complementary variation in the lymphocytes. Little change occurred in the eosinophils.

The time of feeding may be of some significance in these changes in the cellular content of the blood between morning and afternoon samples. The morning bleeding took place about two hours after feeding, while the afternoon bleeding took place just before feeding. The over-all increase in the total white cells in the store pig group as compared with the older pigs may in part be a function of the age of the pig and in part associated with excitement at the time of bleeding. The catching and restraining of the pigs

in this group for the purpose of collecting the blood inevitably cause considerable struggling and excitement. In the case of smaller pigs these are picked up and held under the arm of an assistant while blood is drawn, but as the pig gets older this method is not applicable and such pigs are caught, usually by an ear, and a twitch is placed round the upper jaw behind the canine teeth and twisted up tight. Pigs that are bled regularly may become relatively amenable to restraint, but there are others that continue to struggle fiercely even though they may be bled regularly over a period of several months. This excitement may be a factor in causing the wide range in the total white cells, though we have not been able to find any correlation in practice between the degree of struggling and any extreme variation in the total white cell count. The excitement factor was not in evidence in the older pigs bled at the abattoir.

Over all the 110 samples the total white cell count averaged 19·866, with 6,363 polymorphonuclears (32 per cent.) and 11,326 lymphocytes (66·4 per cent.) and 327 eosinophils (1·6 per cent.). (See Table I.)

Table I

[Average Cell Count Over 110 Blood Samples]

	Total white cell count	Differential count					
		Polymorphonuclears		Lymphocytes		Eosinophiles	
			%		%		%
Sow Group	15,900	5,593	38	9,974	60	318	2
Bacon Group	13,747	3,857	28	9,672	71	137	1
Store pigs—							
Morning	30,666	11,132	36	18,850	62·4	489	1·6
Afternoon	19,150	4,869	26	13,810	72·1	363	1·9
Average	19,866	6,363	32	11,326	66·4	327	1·6

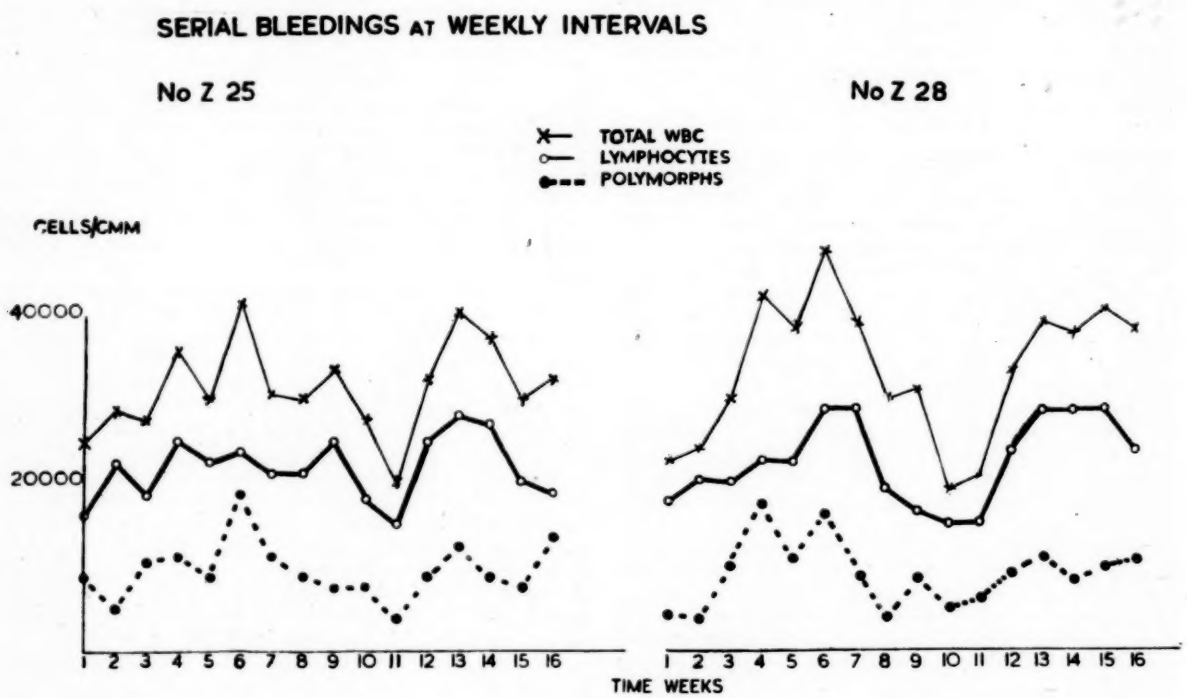
Serial Bleeding at Weekly Intervals

As a preliminary to studying the effect of the tuberculin test on the blood picture a group of three pigs were bled at weekly intervals over a period of 16 weeks, starting when the pigs were 10 weeks old. With the exception of the first bleeding and that at the 14th week all the bleedings were done between 10 to 11 a.m. On the first and 14th week the blood was drawn at 3 p.m. The results in the case of two of this group are depicted in Graph 1.

From this graph it will be seen that the total white cell count in the individual pig varies within fairly wide limits over the period of 16 weeks. The variation in the total white cell counts may be reflected mainly in the lymphocytes at one bleeding or in the polymorphonuclears at another bleeding. In pig No. Z.28, for example, over the 16-week period total white cells varied from 19,200 to 48,550 cells per c.mm., the percentage of polymorphonuclears varied from 16 to 40·5, and the lymphocytes varied from 56·5 to 83·5. Over the same period the eosinophils varied from zero to 5 per cent. However, in spite of the wide variation shown at different bleedings the numerical relationship between the total white cells, the lymphocytes and the polymorphonuclears at any one time remains fairly constant.

Observations on Experimentally-induced Tuberculous Sensitivity in the Pig

The blood leucocyte changes in tuberculous humans and in tuberculous cattle subjected to a tuberculin test have received a fair amount of attention from various workers. Bredeck (1929) made differential counts in patients before and 24 hours after the injection of tuberculin. In positive cases there was an extreme "shift to the left" in the neutrophils as well as a lowered lymphocyte count.


SERIAL BLEEDINGS AT WEEKLY INTERVALS
No Z 25
No Z 28
TOTAL WBC
LYMPHOCYTES
POLYMORPHS
CELLS/CMM
40000
20000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
TIME WEEKS

Graph 1.

Bredeck concluded that the Schilling procedure together with the subcutaneous tuberculin test constituted our most delicate and most accurate method in the diagnosis of early manifest and induced focal activity.

Frazer (1930) found a slight "shift to the left" in reacting cattle and in clinical cases he observed in some a lympnocytosis, while in others an increase in neutrophils.

Tniele (1938) found no significant change in the blood of negative cattle, whereas in reacting cattle a definite increase in neutrophils occurred. This increase was evident 12 hours after injection and was at its height 32 hours later.

Hofferber (1934) found that the blood picture varied with the activity of the disease in tuberculous cattle. He observed a considerable alteration of the polymorphs to mononuclears and immature cells. He concluded that the blood picture may prove of value when used with other aids to diagnosis.

Thijn (1938) found that tuberculous cattle sometimes exhibited a leucopenia, a monocytosis or a neutropenia and concluded that the blood picture alone cannot be considered sufficient basis for diagnosis.

Stasney and Fieldman (1938) used calves injected with live organisms. These were tested with 0·2 c.c. tuberculin containing 0·25 gramme Koch's Old Tuberculin per c.c. Within 24 to 72 hours they noticed an increase in the total leucocyte count, accounted for, mainly, by an increase in the polymorphs. At the same time a lymphopenia was noted.

Hendershott and Johnston (1942), working with cattle, found that in practically all cases in which lesions of tuberculosis were found at *post-mortem* examination the blood survey revealed a marked increase in the number of neutrophils and a corresponding decrease in lymphocytes when tested with tuberculin. Two c.c. of tuberculin, containing 0·0625 c.c. of Koch's Old Tuberculin per c.c., was used subcutaneously. Graphically these changes produced a cross over in the neutrophil lymphocyte ratio and occurred about six hours after injection.

Arthur (1946) compared the blood leucocyte changes during the double intradermal test, using Weybridge Tuberculin in both reacting and non-reacting cattle. He found that the intradermal injection of tuberculin in reacting cattle was followed in 12 hours by a leucocytosis. Also the percentage of neutrophils increased and there was a lymphopenia.

No eosinophilia was found, except in one animal which was under individual study. Here an increased eosinophil count was found at the 60th hour. The significance of an eosinophilia is not clear, but in connection with this phenomenon Rich (1944) has recorded the following pertinent remarks. "It has long been known that the eosinophil commonly appears at the site of hypersensitive reactions of the anaphylactic type. Whatever may be this activity in relation to the anaphylactic reaction, they play no rôle whatever in the tuberculin type of hypersensitivity established during bacterial infection. During the establishment of hypersensitivity, for example, there is no increase in the number of eosinophils in the circulating blood, nor do they tend to appear in any appreciable numbers at the site of hypersensitive reactions produced by tubercle bacilli or by tuberculo-protein." Recent work on the part played by the adrenal cortex on hypersensitivity and related phenomena, as well as the possible rôle of the eosinophil in reactions of this nature, has shown that Rich's interpretation may require modification.

Arthur (1946) also found in his cases that the maximum blood changes occurred six hours after the second injection of tuberculin. No relationship was found between the neutrophilia and the increase in skin measurement.

Kerr, Lamont and McGirr (1949) investigated the leucocyte changes in relation to the intradermal tuberculin test in cattle. Their interpretation of a positive blood reaction is "one in which the lymphocyte polymorphonuclear ratio is less than unity."

No observations of this nature appear to have been recorded in the pig and a series of experiments was begun to collect data on the blood reaction in the sensitised pig during the tuberculin reaction.

The Tuberculin Test in the Non-sensitised Pig

The effect of the ordinary intradermal tuberculin test on the blood picture of the non-sensitised pig was studied. The pigs were injected intradermally in the anterior border of the ear. Mammalian P.P.D. tuberculin was used, each c.c. of which contained 1·5 mg. of tuberculo-protein. The test dose of this tuberculin was 0·1 c.c. The results indicate that in the non-sensitised pig the intradermal tuberculin test does not upset the normal polymorphonuclear lymphocyte relationship. There is a tendency for the total white cell count to drop after the injection of tuberculin and this drop is mainly at the expense of the lymphocytes. Outside of this group we have observed this fall in the lymphocyte after the injection of tuberculin, although it by no means invariably takes place.

As regards the eosinophils, no consistent change has been noted as a result of the tuberculin test in the non-sensitised pig. In view of the small numbers of eosinophils involved or in some cases their absence in the 200 cells counted, it would be unwise to attach too much significance to any apparent changes that take place in the numbers of this type of cell, especially as the amount of blood examined is so small. Again, most of our experimental pigs were exposed to a degree of ascariasis and so one may expect some fluctuations in the eosinophil count as a result of this parasitism (Monnig, 1934). The presence of nematode parasites does in some cases at least appear to be associated with a degree of eosinophilia. It has been noticed that in some of the experimental pigs an increase in eosinophils up to 6 per cent. took place after exposure to ascarid worms. After effective anthelmintic treatment this figure dropped to 1 to 2 per cent.

As part of the preliminary work we also studied the effect of the Stormont tuberculin test technique in the non-sensitised pig. This test was devised by Kerr, Lamont and McGirr (1946), who in the course of their experiments in desensitisation noted that, following the single intradermal injection of tuberculin in the infected bovine, the original injection site exhibited a certain degree of enhanced specific sensitivity. This phenomenon could be detected six to nine days after the initial injection, and so these authors suggested a modified type of test—the Stormont test—in which the tuberculin is injected in the same site on two occasions seven days apart and the criterion of a positive reaction is the difference in skin measurement on the seventh and eighth days. During this test in the pig there is the usual drop in lymphocytes after the initial injection and a more marked drop in the total lymphocytes after the second injection. This drop in the lymphocytes tends to equalise the number of lymphocytes and polymorphonuclears.

The results indicate that ordinary testing procedures in non-sensitised pigs do not induce any marked alteration in the lymphocyte polymorphonuclear ratio.

Experimentally-induced Tuberculous Sensitivity in the Pig

In the records of testing which follow two types of tuberculin have been used.

(*a*) Weybridge P.P.D. avian tuberculin, so-called retest strength containing 0·4 mg. of avian tuberculo-protein per ml.

(*b*) Weybridge P.P.D. mammalian tuberculin, so-called retest strength containing 1·5 mg. of mammalian tuberculo-protein per ml.

Where dilutions are indicated it is one or other of the above tuberculins that has been diluted with normal saline to the dilution stated. In all cases the test dose was 0·1 ml. irrespective of the tuberculin used.

Sensitisation Experiments Using Dead Organisms

Thirty mg. of dead avian organisms in oil were injected intraperitoneally into three pigs six weeks old. The injection caused a very marked increase in the total number of leucocytes during the 24 hours' period following injection. This increase was reflected almost equally in both lymphocytes and polymorphonuclears. In five weeks' time the pigs were tested. The site chosen was the skin of the belly lateral to the mammary nipples. Three strengths of tuberculin were injected at separate sites.

The testing results with the different dilutions of tuberculin used are summarised in Tables II, III and IV. In Graph No. 2 the changes in the cells of the blood in one of this group are depicted graphically.

Table II

Pig Z.29 Sensitised with Dead Avian Organisms
Skin Measurements During the Intradermal Tuberculin Tests

Strength of tuberculin	Initial measurement	At 24 hours	At 30 hours	At 48 hours	At 72 hours	Total increase
	mm.	mm.	mm.	mm.	mm.	mm.
"Retest Strength" 0·4 mg. tuberculo-protein per c.c. ...	4	16	18	12	9	+14
½ strength 0·2 mg. tuberculo-protein per c.c.	4·5	9	10	6	5	+ 5·5
1:10 strength, *i.e.*, 0·04 tuberculo-protein per c.c. ...	4	10	15	11	7	+11

Table III

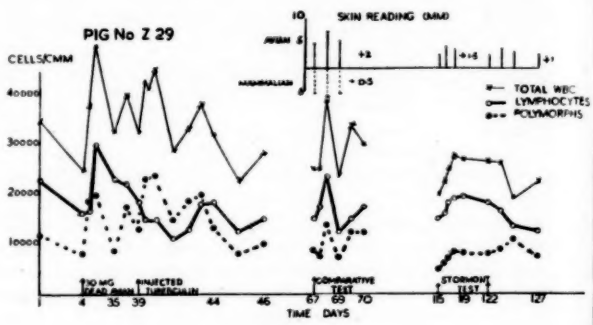
Pig Z.30 Sensitised with Dead Avian Organisms
Skin Measurements During the Intradermal Tuberculin Test

Strength of tuberculin	Initial measurement	At 24 hours	At 30 hours	At 48 hours	At 72 hours	Total increase
	mm.	mm.	mm.	mm.	mm.	mm.
1:10 strength, *i.e.*, 0·04 mg. tuberculo-protein per c.c. ...	5	20	21	19	15	+16
1:100 strength, *i.e.*, 0·004 mg. tuberculo-protein per c.c.	4	9	8·5	8	5	+ 5
1:1,000 strength, *i.e.*, 0·0004 mg. tuberculo-protein per c.c.	3	8	8	7	6	+ 5

Table IV

Pig Z.31 Sensitised with Dead Avian Organisms
Skin Measurements During the Intradermal Tuberculin Test

Strength of tuberculin	Initial measurement	At 24 hours	At 30 hours	At 48 hours	At 72 hours	Total increase
	mm.	mm.	mm.	mm.	mm.	mm.
1:100 strength, *i.e.*, 0·004 mg. tuberculo-protein per c.c.	5	8·5	7	6	6	+3·5
1:1,000 strength, *i.e.*, 0·0004 mg. tuberculo-protein per c.c.	4·5	10	9	6	6	+5·5
1:10,000 strength, *i.e.*, 0·00004 mg. tuberculo-protein per c.c.	3	4	6	4	3·5	+3



Graph 2.

From these results it is reasonable to conclude that a high degree of sensitivity develops in the pig as the result of the intraperitoneal injection of dead avian organisms and that a skin reaction may be invoked by the injection of 0·1 c.c. of a tuberculin containing as little tuberculo-protein as 0·00004 mg. per c.c., *i.e.*, 1:10,000 of the retest avian tuberculin containing 0·4 mg. per c.c.

From both the theoretical and practical point of view it is of importance to ascertain whether desensitisation occurs following a marked reaction to the tuberculin test. As a preliminary measure pigs Nos. Z.29, Z.30 and Z.31 were tested three weeks after the first test. A comparative test was carried out using Weybridge mammalian P.P.D. tuberculin diluted 1:1,000 and 1:1,000 dilution of the avian tuberculin already used. It was hoped that this would determine (*a*) whether any desensitisation had taken place and (*b*) if sensitivity still remained whether or not there was any degree of cross sensitivity exhibited to the heterologous mammalian tuberculin. The mammalian tuberculin was injected into the skin on the anterior border of the left ear and the avian into a similar site on the right ear. Blood counts were made over the period of the anticipated reaction. The results of this comparative test on these three pigs are summarised in Table V.

The apparent loss of sensitivity in these pigs three weeks after the initial test could be interpreted as an indication of a temporary desensitisation following the earlier reaction. This second test took place just over eight weeks after the initial sensitising dose of dead organisms. The possibility that sensitivity to dead avian organisms might only be of very short duration was also considered. It was decided to carry out a Stormont test on these pigs after

TABLE V

COMPARATIVE TEST USING WEYBRIDGE RETEST TUBERCULIN DILUTED 1:1,000 IN THREE PIGS SENSITISED 67 DAYS EARLIER WITH 30 MG. DEAD AVIAN ORGANISMS. LEFT EAR INJECTED WITH MAMMALIAN AND RIGHT EAR WITH AVIAN TUBERCULIN

Pig No.		Initial measurement	24 hours	30 hours	48 hours	72 hours	Increase in mm.
Z.29	Left ear	4·5	5·0	5·0	5·0	5·0	0·5
	Right ear	4·5	6·5	5·5	5·5	5·0	2·0
Z.30	Left ear	5·5	7·5	7·0	7·0	6·0	2·0
	Right ear	4·5	8·0	9·0	8·0	7·0	4·5
Z.31	Left ear	4·5	5·0	5·0	5·0	4·5	0·5
	Right ear	5·0	5·0	5·5	5·0	5·0	0·5

an interval to allow any temporary desensitisation to wear off. The Stormont test had shown itself to be a valuable means of detecting a waning sensitivity in the bovine.

Six weeks later each of these three pigs was subjected to the Stormont test technique. In Z.29 the initial injection using 1:1,000 dilution of avian tuberculin elicited a rise of 1·5 mm. only and to the second injection an increase of 1 mm. only was recorded. In No. Z.30 a rise of 4 mm. occurred after each injection, while in No. Z.31 no skin increase occurred after the first injection and only 1 mm. after the second injection.

These results suggest that under the conditions of testing employed, sensitivity invoked by the intraperitoneal injection of dead avian organisms had virtually disappeared at the end of four months. Only in No. Z.30 was there any degree of sensitivity demonstrable. The intensity of reaction to the first test after sensitisation did not seem to bear any relationship to the final result. It is true that the cross over in the blood in No. Z.29 persisted longer than in either No. Z.30 or No. Z.31, but the skin reactions in Z.29 and Z.30 were very comparable in intensity. The original reaction of No. Z.31 to the first test was not as marked as in Z.29 or Z.30 and yet it appeared to have lost its sensitivity almost completely. It is interesting to record that these three pigs received the following amounts of avian tuberculo-protein during the experimental period:—No. Z.29, 0·652 mg.; No. Z.30, 0·00456 mg.; and No. Z.31, 0·00056 mg.

SENSITISATION USING LIVE ORGANISMS

(a) Avian Type

Pigs Nos. Z.32, Z.34 and Z.36 were sensitised using 10 mg. of a live avian culture intraperitoneally. Pig No. Z.32 was tested as indicated in Table VI. The results show that dilutions of tuberculin as low as 1:100,000 are capable of inducing a skin reaction and a blood response in a sensitised animal. (See Graph 3.) Table VII shows the results of the comparative test in pigs Nos. Z.34 and Z.36. Here a satisfactory skin response was elicited by a dilution of 1:1,000, as well as a fair measure of specificity to the homologous tuberculin.

TABLE VI

PIG SENSITISED WITH LIVE AVIAN ORGANISMS. SKIN TESTING RESULTS

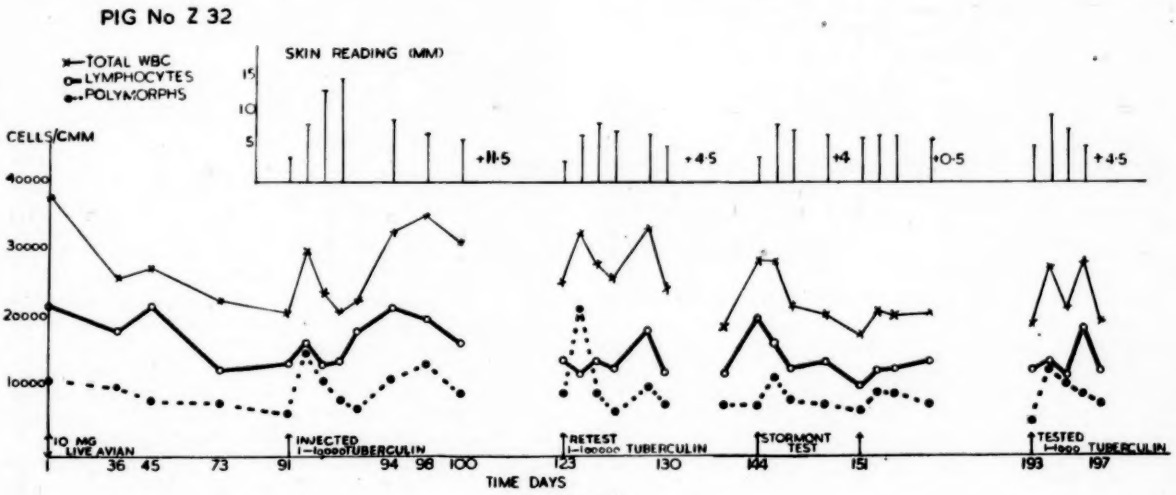
Pig No.	Dilution used	Initial measurement	24 hours	30 hours	48 hours	72 hours	Increase in mm.
Z.32	1:10,000	3·5	8·0	13·5	15·0	10·0	11·5
Z.32*	1:100,000	3·5 (6·5)	6·5 (6·0)	8·0 (6·0)	7·0 (5·5)	6·0 (5·0)	4·5

* Tested at new site three weeks later. Old site measurements in brackets.

TABLE VII

COMPARATIVE TESTING USING RETEST TUBERCULIN DILUTED 1:1,000 IN LIVE AVIAN SENSITISED PIGS

Pig No.		Left ear avian and right ear mammalian tuberculin					
		Initial measurement	24 hours	48 hours	72 hours	96 hours	Increase in mm.
Z.34	Left ear	3·0	9·0	14·0	11·5	9·0	11·0
	Right ear	3·5	4·5	6·0	6·0	4·5	2·5
Z.36	Left ear	3·5	16·0	17·5	16·5	15·5	14·0
	Right ear	3·5	8·0	8·5	8·0	7·5	5·0



GRAPH 3.

Pigs Z.34 and Z.36 were again tested three weeks later with 1:1,000 tuberculin and there was evidence of a waning sensitivity as judged by the much smaller increase in skin measurements. There was no recall effect on the old site at the second test.

In view of this apparent drop in sensitivity it was decided to wait a further three weeks and subject the pigs to the Stormont testing technique, using again the 1:1,000 dilution of tuberculin. To the initial injection of the Stormont test the skin response indicated a drop in sensitivity as compared with the first test after sensitisation and no boosting effect was observed to the second injection seven days later.

Six weeks later this group were tested using a tuberculin diluted 1:1,000 and the skin responses were only of the order of 3 to 4·5 mm. (see Graph 3 test at 193 days). Finally, five weeks later, at 227 days after sensitisation these three pigs were tested with retest strength and 1:1,000 tuberculin. These results are summarised in Table VIII. The differences in response at this stage to the two strengths of tuberculin are very striking.

TABLE VIII

COMPARATIVE SKIN REACTIONS TO 1:1,000 AVIAN TUBERCULIN AND RETEST WEYBRIDGE AVIAN TUBERCULIN (0·4 MG. TUBERCULOPROTEIN PER ML.) IN THREE PIGS SENSITISED 227 DAYS EARLIER

Pig No.	Tuberculin used	Initial measurement	24 hours	48 hours	72 hours	96 hours	Increase in mm.
Z.32	1:1,000 dilution	6·5	6·5	6·5	6·5	6·5	+ 0
	Retest strength	6·0	16·5	34·5	19·0	14·0	+28·5
Z.34	1:1,000 dilution	5·5	6·5	6·0	6·0	6·0	+ 1
	Retest strength	5·0	16·0	20·5	17·5	13·0	+15·5
Z.36	1:1,000 dilution	8·0	9·0	8·5	8·0	8·0	+ 1
	Retest strength	8·5	14·5	21·0	15·0	11·0	+12·5

(b) Bovine Type

In pigs Nos. Z.33, Z.35 and Z.37 sensitivity to the bovine type of organism was induced by injecting intraperitoneally 1 ml. of an emulsion prepared from a tuberculous bovine bronchial gland. Sixteen weeks after inoculating the sensitising dose of material these pigs were tested. The results are shown in Table IX and they indicate that a high degree of sensitivity was produced and that at the dilutions used a high degree of specificity was exhibited by the homologous tuberculin.

No. Z.33 was tested 14 days later with tuberculin diluted 1:100,000 and showed an 8·5 mm. increase in skin measurement and a positive blood reaction. (See Graph 4.) Z.35 tested after the same interval with 1:1,000 tuberculin showed no diminution in sensitivity as compared with the previous test in this animal, but in the case of Z.37 there appeared to be some loss of sensitivity at this second test 14 days after the original test. There, again, there was little or no recall at the old testing site during this second test at a new site.

TABLE IX

BOVINE SENSITISED PIGS. COMPARATIVE TESTING

Pig No.	Tuberculin used	Initial measurement	24 hours	48 hours	72 hours	96 hours	Increase
Z.33	Mammalian 1:10,000	4·0	25·0	25·0	20·0	12·0	21·0
	Avian 1:10,000	4·0	5·0	4·5	4·5	4·5	1·0
Z.35	Mammalian 1:1,000	3·5	21·0	18·0	15·5	8·0	17·5
	Avian 1:1,000	3·5	7·5	7·0	5·5	5·0	3·5
Z.37	Mammalian 1:1,000	4·0	15·0	15·0	12·0	6·5	11·0
	Avian 1:1,000	4·0	5·0	5·0	5·0	4·5	1·0

Three weeks later the Stormont technique was applied to these three pigs. After the initial injection a satisfactory degree of sensitivity was demonstrated, but once again the response to the second injection was much lower. Six weeks later (198 days after sensitisation) this group was tested again using 1:1,000 tuberculin. All three showed a high degree of sensitivity. See Graph 4. This graph also depicts the type of blood reaction shown by this group.

DISCUSSION

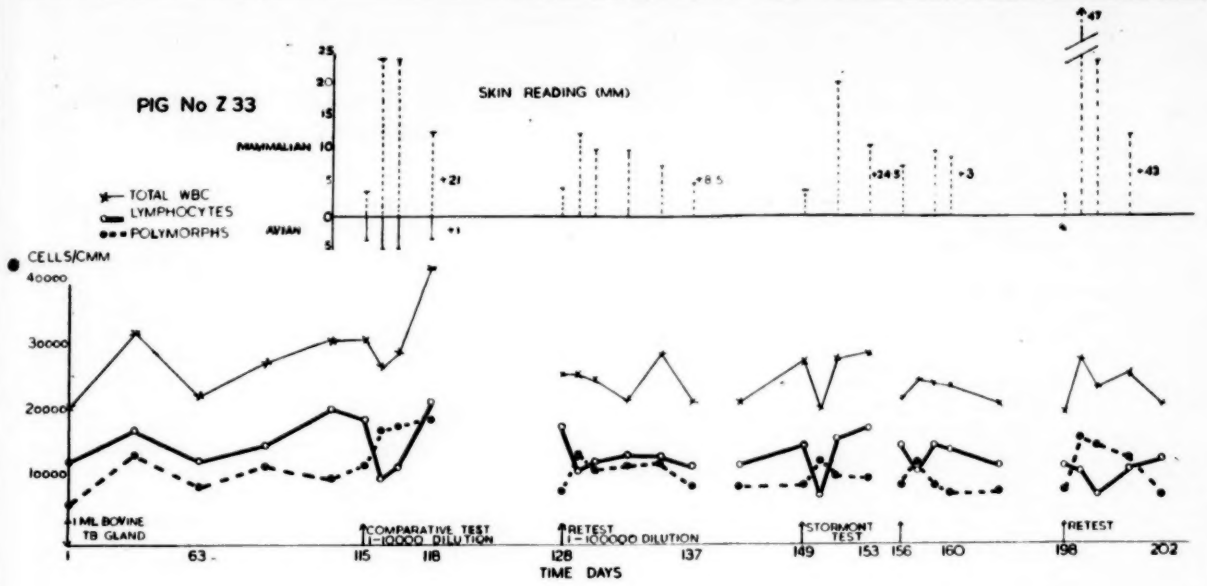
The blood reaction in the sensitised pig as the result of the injection of tuberculin follows a pattern similar to that already reported for the sensitised bovine by Kerr, Lamont and McGirr (1949). A positive blood reaction may be defined as one in which there is a drop in the number of lymphocytes and a rise in polymorphonuclears sufficient to produce a " cross over " when these results are depicted graphically, or, in other words, when " the lymphocyte polymorphonuclear ratio is less than unity." Typically, a positive blood reaction occurs when tuberculin is injected intradermally into a sensitised pig and the cross over is apparent within two hours. A variation of this typical positive reaction occurs when the drop in lymphocytes and rise in polymorphonuclears is insufficient to produce the cross over. This may be designated a depressed positive reaction.

Occasionally the positive blood reaction is delayed for about 24 hours. In typical cases the blood reaction is past its peak before the skin reaction reaches its maximum. In the bovine the blood reaction occurs at six to 24 hours after injection.

When 30 mg. of dead tuberculosis organisms are injected intraperitoneally in oil a shock reaction occurs in the blood. There is a rapid increase within the following five hours in the total white cells. This increase is at its peak in approximately 24 hours. There is a concomitant increase in the polymorphonuclears, but the increase which takes place in the lymphocytes is usually slightly delayed until after the five-hour period. (See Graph 2.)

After the injection of tuberculin in the sensitised animal a marked increase in the number of polymorphonuclears may occur without much change in the number of lymphocytes. This is interpreted as an immunising response.

Using the dilute tuberculins the skin reactions were usually at or near their maximum at 24 hours. There was seldom more than a few millimetres in difference between



Graph 4.

the 24 hour and the 48 hour reading. The only exception was in the final test of the live avian sensitised group, where the maximum skin reaction was reached at 48 hours. (See Table VIII.) Even in these cases, however, the reaction at 24 hours was such as left no doubt as to its positive character. This reaction was elicited by the retest strength of Weybridge avian tuberculin containing 0·4 mg. of tuberculo-protein per ml.

A fair degree of sensitivity can be established by the intraperitoneal injection of dead avian organisms as judged by the test results using retest strength tuberculin and 1:10 dilution. (See Table II and III.) With the more dilute tuberculins, however, the skin reaction tends to be very small and positive blood reactions only irregularly produced.

A sensitivity induced by the injection of live avian organisms does not seem to be maintained at a high level for very long. For example, two tests four weeks apart with the same tuberculin indicate a marked loss of response to the second test. This, however, could be due to a temporary desensitisation following the earlier test. However, the same dilution of tuberculin (1:1,000) which produced a positive blood reaction and an 11·15 mm. rise in the skin at 91 days after sensitisation invoked only a depressed positive type of blood reaction and a 4·5 mm. increase in skin thickness 193 days after sensitisation. At 227 days after sensitisation in the same animal this 1:1,000 tuberculin failed to induce any rise in the skin, whereas the injection of the retest strength of tuberculin provoked a rise of 28·5 mm. in the skin. (See Table VIII, pig No. Z.32) It would appear that in these cases sensitivity commences to wane fairly quickly with live avian organisms and that a quantitative factor is involved in eliciting responses in the older infections. It is hoped to investigate further the implications of these findings.

A sensitivity of a high order readily develops in the pig to the bovine type of bacillus and a positive blood reaction and a skin reaction may be elicited by a tuberculin containing only 0·000015 mg. of tuberculo-protein per ml. Pig No. Z.35 was tested twice three weeks apart with the same dilution of tuberculin without any appreciable drop in sensitivity occurring at the second test. Sensitivity after a period of 227 days remained at a high level in the live bovine sensitised group.

When skin reactions are large, *i.e.*, showing an increase of 10 mm. or over, there is a tendency for superficial necrosis to take place. In such cases the reaction site develops a purple centre. This discoloration is apparent at 24 hours and necrosis may be evident at 36 hours. The superficial necrotic area may not slough off for two to three weeks after the reaction has subsided.

The comparative test in both avian and bovine sensitised groups using 1:1,000 and 1:10,000 dilution of tuberculin showed a fair measure of specificity and there was little reaction to the heterologous tuberculin. Again, with the tuberculins used a second test at a new site caused little or no increase in skin measurement at the site of a former test.

The results of the Stormont test technique on both avian and bovine sensitised pigs require some comment. In the tuberculous bovine the site of the intradermal injection of tuberculin exhibited increased sensitivity to the second tuberculin injection given seven days after the primary inoculation. In all cases in the pig, however, the response to the second test injection was much less than that to the first injection, indicating that in the pig there is no increased sensitivity at the site of injection after an interval of seven days. Whether this desensitisation to the second injection is local or general will be investigated later.

Summary

1. Results of certain initial investigations into the problem of tuberculous sensitivity in the pig are presented.

2. The total white cell count in the normal pig fluctuates within wide limits. In a series of 110 samples from pigs of various ages the total white cell count averaged 19,866 cells per ml. The lowest count was 8,900 in a bacon pig and the highest was 42,200.

3. Sensitivity to dead avian organisms appears to wane

fairly rapidly as judged by testing results using 1:1,000 dilution of tuberculin.

4. Sensitivity to live avian organisms can readily be established, but there is evidence that the sensitivity tends to wane fairly quickly.

5. A high degree of sensitivity follows the intraperitoneal inoculation of material containing live bovine organisms. This sensitivity was still of a high order 227 days after sensitisation.

Acknowledgments.—The author wishes to record his thanks to Dr. H. G. Lamont and Dr. W. R. Kerr for their help and criticism, to Mr. T. Cahill for technical assistance during the work and to Mr. T. Todd for help in preparing the graphs.

References

Arthur, G. H. (1946.) *Vet. J.* **102.** 147.
Bredeck, J. F. (1929.) *Amer. Rev. Tuberc.* **20.** 52.
Frazer, A. C. (1930.) 1st Report Director Inst. Animal Path., Cambridge.
Hendershott, R. A., & Johnston, C. B. (1942.) *Proc. 45th Ann. Meet. U.S. Livestock San. Assoc.* 157.
Hofferber, O. (1934.) *Arch. wiss. Tierheilk.* **68.** 50.
Kerr, W. R., Lamont, H. G., & McGirr, J. L. (1946.) *Vet. Rec.* **58.** 443, 451.
——, —— & ——. (1949.) *Ibid.* **61.** 466.
Monnig, H. D. (1934.) Veterinary Helminthology and Entomology.
Rich, A. R. (1944.) Pathogenesis of Tuberculosis.
Stasney & Fieldman. (1938.) *Amer. J. med. Sci.* **195.** No. 1. 20.
Thiele, K. (1938.) Inaug. Diss. Berlin.
Thijn, J. W. (1938.) *Tidsskr. Diergeneesk.* **65.** 8.

LIVESTOCK PRODUCTION IN NORTHERN IRELAND

Speaking in the Northern Ireland House of Commons recently, the Minister of Agriculture said that the estimated output of cattle for the current year showed an increase of 12 per cent. over 1946-47. For pigs the increase in this period was no less than 233 per cent., for milk 23 per cent., and for eggs 40 per cent. During these years the issues of rationed feeding-stuffs increased by no less than 70 per cent.—from 348,288 tons in the year ending April 30th, 1946, to about 592,000 tons in the year just ended. It was very obvious, therefore, that the striking increase in the production of livestock and livestock products which had occurred had been due to the increase in the issues of rationed feeding-stuffs. The Minister went on to refer to the uncertainties in regard to the future of livestock production unless they could make themselves more self-supporting by means of increased home-grown feeding-stuffs.

Turning to production objectives, the Minister said so far as cattle, sheep and pigs were concerned the Government was anxious to see as much produced as farmers could find it practical and possible to produce. In the case of milk, however, a further expansion was not desired and with eggs also the present level of total production was regarded as reasonably adequate.

In a reference to the Attested Herds Scheme, the Minister said that it continued to make good progress. There were now 560 attested or supervised herds, compared with about 250 herds when he presented last year's estimates.

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CENTRAL INDEX OF TRANSLATIONS

To keep research workers informed of developments in foreign countries the Association of Special Libraries and Information Bureaux is preparing a central index of translations which will include scientific papers, reports and articles from foreign journals. It is intended that the index shall provide a guide to all translations held in this country and the Commonwealth, and all organisations holding translations and willing to take part in the scheme are invited to get in touch with Aslib. A limited number of translations has already been indexed. Enquiries and offers of co-operation should be made to Aslib, 4, Palace Gate, London, W.8.

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Following the earlier statement that despite the withdrawal of the British Medical Association from the joint meeting proposed to be held in South Africa in 1951, it would still take place, the S.A. Medical Association has now announced that there will be no congress at all in Johannesburg in July this year.

CLINICAL COMMUNICATION

A CASE OF PRESUMED RHODODENDRON POISONING IN SHEEP

P. G. HIGNETT,

From The Wellcome Veterinary Research Station, Frant, Sussex

A flock of 70 mature Kent wethers is maintained on this Station for the production of sterile sheep blood. In late November, 1950, these wethers, together with 30 ewe tegs of the same breed, were grazing lucerne. On November 27th, as the lucerne was becoming poached, these sheep were moved to an 18-acre park of old pasture which is never known to have been ploughed. The park, which is of roughly triangular shape, slopes towards the east and is surrounded on two sides by evergreen plantations standing behind an iron fence. Rhododendrons grew sufficiently near to this fence to be grazed with ease by all classes of animals. There were also in this park at the time 15 dry cows and six horses. Kale in abundance was fed to the animals in the park, but it was noticed that the sheep ate very little. As there was a reasonable amount of grass this caused no concern. Throughout November 28th there was heavy and continuous rain which did not cease until the early hours of November 29th. Since the Station was established in 1943 sheep of various breeds, including Kents, have grazed this park almost continuously without showing any ill-effects.

November 29th.—10.30 *a.m.*—It was reported that one wether was ill. The sheep was unable to rise and showed great respiratory distress and profuse salivation. One's first impression was that it was choked, possibly by a piece of kale. Careful examination, however, failed to reveal any obstructions and tracheotomy did not make breathing easier.

2 *p.m.*—The wether died and on *post-mortem* examination the rumen was found to be packed with a mass of rhododendron leaves and twigs. No other macroscopic lesions could be seen and bacteriological cultures were not made.

3 *p.m.*—Up to this time only this one sheep had been noticed to be ill, but when the shepherd rounded up the sheep for a routine daily examination it was at once apparent that many sheep were affected. As the flock was driven up the hill towards the catching pens many sheep collapsed and lay panting. By the time the flock reached the top of the hill about 20 sheep had been left behind. All these sheep, after lying for a few minutes, got up and rejoined the flock.

On the basis of history and *post-mortem* findings it was felt that a diagnosis of rhododendron poisoning was justified.

A dozen of the worst affected sheep were removed to a loose box where they were kept as quiet as possible and, in the absence of any specific treatment, were dosed with strong black coffee as a stimulant. Several of the sheep that were moved to the box were in a state of collapse with severe dyspnoea, profuse salivation and teeth grinding. Several of them gave a peculiar groaning scream at intervals. The remainder of the sheep in the flock were transferred to another field and fed hay which they ate readily.

November 30th.—One wether in the box had died during the night. All the rest of the flock appeared much better.

December 1st.—A further wether in the box was very

ill and was slaughtered and during the day two more sheep, which in the morning appeared quite well, were found dead —one in the field, one in the box. *Post-mortem* examination of these two sheep revealed no significant lesions and again bacteriological cultures were not made. Rumen contents were macerated, but one recognisable piece of rhododendron leaf was found. During the day 19 of the sheep in the flock were bled 750 ml. each without showing any ill-effects.

It is interesting to observe that, as in the case of laurel poisoning reported by Robb and Campbell in 1941, the poisoning occurred after heavy rainfall, that deaths occurred up to two days after removal from the rhododendron and that many hundreds of sheep had previously been grazed in this park under similar conditions without coming to any harm.

REFERENCE

ROBB, W., & CAMPBELL, D. (1941.) *Vet. Rec.* **53.** 93.

ABSTRACTS

[Veterinary Use of Chlorophyll in Tissue Cell Stimulation. SCHAFFER, J. D. (1950.) *N. Amer. Vet.* **31.** 817–819.]

Chlorophyll has been accepted as a healing agent from ancient times, when green leaves or their juices were applied to wounds. Its controlled application either as a 1 per cent. solution in distilled water or in ointment base has been extensively studied since Verdeil's original essay of 1851. Chlorophyll stimulates the haemopoietic processes of the living body, promotes cell metabolism and is an active biocatalytic agent. It is non-toxic and as a wound dressing does not produce scab formation under which anaerobic growth is encouraged. It is a deodorant.

Seven case-records covering crushing, scalding, burning, fistulous withers, laceration and puncture with necrosis are recorded in horse, dog and cat. All responded well to routine surgical cleansing followed by topical applications of solution or ointment at regular intervals. The resultant minimum of scar tissue was noted particularly.

J. P.

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[Aureomycin in the Treatment of Infectious Diseases of Bovines. LOWER, H. C. (1950.) *N. Amer. Vet.* **31.** 800–805.]

This author gives some indication of the wide potentialities of aureomycin in bovine practice when this drug becomes freely available at an economical price. Good results are claimed from its use in some cases in which favourable response would not have followed treatment with drugs available in the past, *e.g.*, in the treatment of acute mastitis, metritis, foul in the foot, pneumonia, calf scours, gas gangrene and traumatic gastritis. An intravenous dosage rate of 5 mg. per lb. bodyweight is based on a table showing this dose to maintain a bacteriostatic serum concentration for periods up to 24 hours. This amazingly long duration is approximately seven times that expected from a comparable dose of penicillin. Assessment of the author's claims, however, is complicated by a complete lack of bacteriological diagnosis and often by prior treatment with sulphonamides and penicillin.

Lower claims 100 per cent. clinical cures in 20 cases of acute staphylococcal mastitis following intramammary injections of 200 mg. supplemented in some cases with

(Concluded at foot of next column)

QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address. It is regretted that consideration cannot be given to questions for which solely a private reply is required.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

"Mad Staggers" (?) in Horses

Q. 388.—*Is there a condition called "Mad Staggers" in horses? If so, what are the causes, symptoms and treatment?*

A.—The word "staggers" was at one time much in use. Matthew Hodson writes ("The Running Horse," *circa* 1700), "Staggers comes at first of some corrupt blood or gross or tough humours oppressing the brain, from whence proceedeth a vaporous spirit, dissolved by a weak heat which troubleth all the head. The signs are these: distress of sight and reeling and staggering to and fro: he with very pain will thrust his head against the wall and forsake his meat." For this he prescribes bleeding by a notched stick passed up the nostril as well as bleeding from the neck vein and swabs of brandy stitched into the ears. He writes of "mad staggers" that the horse will "foam at the mouth white and will seem dull headed and will have at that time a blue film over his eye and will wander up and down." This was to be treated with opium and by bleeding from the jugular vein.

J. Wortley Axe ("The Horse," 1905) speaks of "sleepy staggers" and "mad staggers" as both being signs of stomach impaction for which he prescribes a purge and bleeding.

The 1923 edition of G. H. Wooldridge's Encyclopaedia has only one reference to "mad staggers," in an article by Sir Arnold Theiler in which he refers to horses "uncontrollable, having a persistent tendency of pushing in the one forward direction until they are exhausted." The cause in these cases was attributed to acute parenchymatous hepatitis following certain inoculations against horse sickness.

The writer has seen signs in the horse which could be described as "mad staggers," due to digestive disturbance, corrosive poison, tuberculosis, anthrax, rabies and brain tumour.

The answer to your questioner is that "mad staggers" was at one time considered to be a specific disease. The term is now in disuse except as a vivid description of a sign of disease. The sign may be traceable to many causes and treatment, which must be based on a full investigation of each case, can only be symptomatic.

Treatment of Ringworm in Cattle

Q. 389.—*A client has asked me for treatment for ringworm in cattle. He has been troubled with this for almost ten years—it appears to defy all the usual forms of treatment: if you could give me some advice I would be grateful.*

A.—The chief difficulty in the treatment of ringworm in cattle is to get the adequate co-operation of the owner. He

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intravenous aureomycin. Metritis in four cows was successfully treated by the intrauterine injection of 500 to 850 mg. aureomycin. Foul in the foot responded to systematic administration in five out of six cases and to topical application of aureomycin ointment in one case. Five cases of pneumonia responded rapidly. Remarkable response was shown in 24 out of 30 cases of calf scours following one intravenous dose of aureomycin. Post-parturient gas gangrene showed complete recovery after two injections at an interval of 96 hours.

G. J. K.

knows that in most instances the lesions will disappear of their own accord in spring and in consequence he is unwilling to put much effort and labour into the treatment of the disease. He also expects treatment which will give a certain cure in one application and such a preparation is not yet available. This attitude of the farmer, coupled with the fact that the spores can survive for a very considerable period, ensures that the disease is generally present year after year on the farm. In the case of calves it is very desirable to move them when possible from the buildings into a temporary yard constructed of straw bales which can be burnt after treatment. This arrangement permits thorough disinfection of the vacated buildings. A blow lamp is a very desirable part of the disinfection. Many agents will produce a cure provided that they are applied thoroughly and sufficiently frequently, but the respondent favours 5 per cent. salicylic acid in a water soluble ointment base (Genatosan Base A) or prepared as a liniment in cod-liver oil. The dressing is applied at three-day intervals, well rubbed into the lesions with a toothbrush, and the farmer should be warned of the danger of the spread to man. Limited trials with sodium iodide intravenously have not yielded results which justified the continuance of this line of treatment.

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Feeding of Hounds on Tuberculous Carcases

Q. 390.—*The Master of Hounds has received objections from farmers owning Attested Herds, about hounds frequently fed on tuberculous carcases passing over their fields. Can this risk be ignored? How would an investigation into the incidence of tuberculosis amongst the pack be carried out?*

A.—Hounds are very resistant to experimental infection with tuberculosis (*Brit. J. Pharmacol.* (1950.) **5.** 549) and no record is known of tuberculosis in a hound. The tuberculin test could be applied to a pack of hounds, but it is not very reliable.

It usually takes large doses of tubercle bacilli to infect any animal by the oral route, and it is a very rare event for large numbers of tubercle bacilli to be present in the flesh, even in advanced cases of tuberculosis. Even supposing, for the sake of argument, that a few bacilli did get into pastures from hounds, it has been shown that animals turned into pastures just vacated by heavily infected bovines (not that this is a good practice) do not become infected with tuberculosis; it does emphasise, however, that infection occurs chiefly in the cowshed from inhaled droplets.

Evidence supporting the foregoing statements has been presented in "Bovine Tuberculosis" (J. Francis, 1947, Staples Press). It may be concluded that the risk of attested herds becoming infected as a result of hounds passing over the pasture can be ignored.

. . . . .

Snuffles in the Rabbit

Q. 391.—*What is the cause of snuffles in the rabbit, and is there any known curative treatment?*

A.—"Snuffles" in the rabbit has been attributed to many different causes, various organisms having been incriminated as the causative agent from time to time. Since the disease is chronic it seems unlikely that there is a virus directly involved, although it is not impossible that a virus of low virulence may be present in infected rabbitries which, although causing no obvious disease of itself, does allow secondary invaders to establish themselves as pathogens in the upper respiratory tract. The organisms most commonly isolated are *Pasteurella lepisepticum* and *Haemophilus* (*Brucella*) *bronchisepticus*, either singly or together.

The condition is essentially one of the large rabbitry where morbidity is high but mortality low. Various treatments including the sulpha drugs, antibiotics and autogenous vaccines have been used with little or no success. The only method of abolishing infection is to eradicate the entire stock, rebuild or disinfect and leave vacant the hutches and restock after an interval of at least six weeks. It need hardly be said that few rabbit fanciers will agree to this course since the disease is not a "killer." A curious feature is that "snuffles" is frequently present in rabbitries where no obvious fault can be found with the management. It has been suggested that the presence of coccidia is a contributory factor in this disease, but this does not appear to be true of all outbreaks. A deficiency of vitamins A and D has also been suggested especially in rabbits kept indoors.

References

Blount, W. P. (1945.) "Rabbit ailments." Bradford: "Fur and Feather."

Parish, H. J. (1950.) "Notes on Communicable Diseases of Laboratory Animals." Edinburgh: E. & S. Livingstone Ltd.

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Correspondence

Kale and Rape Poisoning in Cattle

Sir,—The reply to the question on the above topic given in April 14th issue of this journal prompts me to add a little to the answer given.

A. It appears that there is no report in the literature of haemoglobinuria in cattle arising from the ingestion of kale. I would therefore like to record an experience encountered in 1943.

In January of that year, a cow was examined that, overnight, had developed "red water." The only symptom exhibited was haemoglobinuria and a second visit was made in the afternoon before making a diagnosis. By then six or seven cows (I cannot recollect the exact number) were voiding blood-coloured urine without any other symptom being apparent. A sample of urine allowed to stand in a glass jar from the previous visit had shown no evidence of sedimentation of the red colour; this assisted in differentiating from haematuria. Within two days eleven out of the 12 cows in the herd had developed the condition.

The cows had been fed kale that had been cut and carried into the cowshed for feeding, up to a couple of days previous to the incident. They were then turned to graze the stumps and fallen leaves that remained in the field. The period of grazing was about two hours each morning. There had been heavy frost during both the preceding nights.

The diagnosis arrived at was haemoglobinuria following the ingestion of frosted kale.

Treatment consisted of abstinence from kale—but no other dietary change—and the administration of iron tonics. Three animals were injected with Acapron, one of the specific chemotherapeutic drugs for piroplasmosis, but these showed no deviation from the course followed by the others. Some animals developed pallor of the mucous membranes but all recovered from the haemoglobinuria in three to five days.

B. Rape is becoming an increasingly popular crop for the grazing by dairy cattle in the autumn and winter in South-West Wales. There is very little mention of its use as such in text-books on animal nutrition. Halnan and Garner (1944) point to the advisability of feeding after milking as a precaution against tainting the milk. The incidence of rape poisoning is on the increase.

The two syndromes commonly encountered are:—

(*a*) Acute pulmonary emphysema and oedema; this resembles the syndrome of "fog fever" which develops in the autumn among animals grazing aftermath or foggage.

(*b*) Haemoglobinuria; the loss of blood in some of these cases can be extensive and occasional deaths occur in this syndrome as well as from the above.

Other syndromes include symptoms of nervous derangement, blindness, constipation and bloat. These may occur singly or as complexes.

The seasonal incidence is a reflection of the autumn and early winter grazing of the rape crop. The condition appears commoner some years than others and one gets the impression that frosting of the rapidly growing rape is a common feature, but this is not constant, neither is the purpling of the plant which has been incriminated. (Cote, 1944.) Fields on which the trouble has occurred have been examined and they vary from clean crops to those heavily contaminated with weeds.

So far very little investigation into the condition has been reported

and some preliminary data are being collected at Aberystwyth. Schofield (1947) reports the production of a marocytic anaemia in cattle fed rape; this was not alleviated by supplementing with hay or minerals. He failed to determine the cause of the anaemia.

In view of the increasing incidence of the condition, it may be appropriate to reproduce in this journal, at some future date, the contribution by Cote.

These few remarks and observations are offered in order to draw attention to the problem and place on record its occurrence in South-West Wales.

References

Halnan, E. T., & Garner, F. H. (1944.) The Principles and Practice of Feeding Farm Animals. Page 111. (London: Longman, Green & Co.)

Cote, F. T. (1944.) *Canad. J. comp. Med.* **8.** 38-41.

Schofield, F. W. (1947.) Report of the Ontario Veterinary College. Pp. 122-125.

Yours faithfully,

University College of Wales, E. T. Rees Evans.
Department of Animal Husbandry,
Section of Animal Health,
Dairy Buildings,
Llanbadarn Road, Aberystwyth.

April 16th, 1951.

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Prevention of Foot Rot in Cattle

Sir,—In *The Veterinary Record* of February 24th, prevention of foot rot in cattle is discussed in the Questions and Answers column. I find this of particular interest, as the prevention and treatment of foot rot in a herd of 1,600 dairy cattle has been a source of headaches to me for many years.

Cattle have been imported into this herd variously from Australia, Canada, Scotland, Holland and the United States of America in shipments of anything from a dozen up to 100. Foot rot occurs among those cattle (which arrive in the cooler spring months) during their first summer months of tropical heat in this colony: as many as 40 in a shipment of 100 may be affected, and a few of those 40 may die from the effects of the foot rot combined with heat exhaustion. Incidence among locally bred animals, or imported animals subsequent to the first summer in Hong Kong, is rare indeed.

The practice of making each individual animal stand for five minutes daily in a foot-bath containing copper sulphate solution proved to be quite useless in preventing the trouble. On one occasion the exercising paddock attached to a shed containing 50 newly imported cows was cemented over (cows are not grazed here): this proved equally futile, as was the case in animals from another shipment which were kept inside the cowshed throughout their first summer.

Since the war incidence and mortality are not so high: while popular opinion has suggested that this may be due to the fact that during nearly four years of Japanese occupation no cattle were imported, it is more likely due to the immediate use of sulphapyridine soluble intravenously in every case where symptoms of foot lameness appear.

Yours faithfully,

H. C. Watson.

The Dairy Farm, Ice & Cold Storage Co., Ltd.,
Hong Kong.

April 10th, 1951.

THE DANGEROUS DRUGS BILL

A Government Bill to consolidate the Dangerous Drugs Acts, 1920 to 1950, has been introduced in the House of Lords by the Lord Chancellor. The Bill also incorporates section 28 of the Pharmacy and Poisons Act, 1933, which amended earlier Pharmacy Acts so as to make the Dangerous Drugs legislation refer to "authorised sellers of poisons" instead of the person who "keeps open shop." The new Bill does not introduce any amendments: it consolidates a number of enactments, including the Orders applicable to Northern Ireland. The consolidation therefore makes for clarity in the understanding of this legislation.

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Weekly Wisdom

Let us welcome to our shores the many members of our British Commonwealth, and all the visitors from other lands who have come to see what this old country can do. And let us pray that by God's good grace the vast range of modern knowledge which is here shown may be turned from destructive to peaceful ends, so that all peoples, as this century goes on, may be lifted to greater happiness.—H.M. the King, declaring open the Festival of Britain.

REVIEW

[Lewis's Medical, Scientific and Technical Lending Library Catalogue, Revised to December, 1949. Pp. xxi + 1152. Price 35s. net.]

Over 27,000 titles are included in this catalogue, of which but 130 have any direct veterinary bearing. The blame for this paucity must be attributed more to the lack of works of veterinary reference than to lack of initiative on the part of the library, which presents a remarkably comprehensive collection of books in every field of scientific endeavour. The agricultural section is particularly full.

The catalogue itself is divided into three parts. First, authors and titles, second, classified index of subjects with names of authors who have written upon them, and third, alphabetical list of subjects, which is found to be a most convenient arrangement. Additions to the catalogue are published bi-monthly, so that one's information is always up to date.

IN PARLIAMENT

Pet Animals Bill

On Friday of last week the House of Commons welcomed and gave a Third Reading to the Private Member's Bill, introduced by Mr. Ronald Russell, to regulate the sale of pet animals. As intimated in our issue of April 14th, when we gave an extended report of the debate on Second Reading, this measure differed mainly from that introduced by Brigadier Peto in 1949 in the insertion of "veterinary practitioner" and the substitution of "an inspector of the R.S.P.C.A." for "an officer of an animal protection society" in the list of those whom a local authority are authorised to appoint for the inspection of pet shops. A further change was the exclusion of the application of this measure to Northern Ireland in addition to Scotland. As amended in Committee, however, constables and inspectors of the R.S.P.C.A. have now been excluded from the officials whom local authorities may authorise to inspect pet shops, while the application of the Bill to Scotland has been agreed.

Among other agreed amendments were the following: On Clause 4 (Inspection of Pet Shops) an amendment to ensure compliance with such precautions as the licensing authority may specify to prevent the spread among animals of infectious diseases. In moving, Sir Jocelyn Lucas expressed the hope that the authorities would consult with veterinary authorities and the Ministry of Agriculture for advice on the framing of suitable regulations, "otherwise there may well arise a large number of civil actions for losses of animals and birds caused by the spread of disease which has been carried by inspectors on their lawful occasions." An amendment on Clause 7 (Interpretation) has the purpose of ensuring that a genuine breeder, who occasionally buys outside stock with the idea of a change of stock or for other purposes, is not liable to be licensed as the keeper of a pet shop.

Another valuable improvement is that inspection will now include not only premises, but anything inside them—namely, kennels and cages and anything else in which animals may be kept.

The date of the operation of the Bill has been deferred from January 1st, 1952, to April 1st, 1952.

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Questions

New Slaughterhouses

Mr. Dye (April 30th) asked the Minister of Food whether he is yet in a position to provide additional slaughtering capacity to deal with the increasing numbers of livestock which are now being produced.

Mr. Webb: Yes. The Government are taking every possible step to meet the urgent need for additional slaughtering capacity to deal with the increasing numbers of livestock. Whilst we cannot do all that we should like owing to the present limitation on capital investment, I am glad to say that the Government have decided to build seven new slaughterhouses in areas where additional premises are most urgently needed, namely, in: Canterbury, Grimsby, Salisbury, Sunderland, Swindon; one in the neighbour-

hood of Bolton, Leigh and Wigan; one in the neighbourhood of Bournemouth and Poole. Consultations with the local authorities are now well advanced. The seven new slaughterhouses will be in addition to the experimental slaughterhouses which are already being built at Fareham and Guildford.

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Milk (Quality)

Sir W. Smithers (April 30th) asked the Minister of Food if he has considered the report by the National Institute for Research in Dairying in conjunction with officials of the National Farmers' Union, details of which have been sent to him, on the decline in the quality of milk; and to what extent the number of cases where milk is rejected because it is below the minimum legal standard has increased since January 1st, 1951.

Mr. Webb: In consultation with my right hon. Friend the Minister of Agriculture, I am already considering ways of encouraging an improvement in the quality of milk; and we shall of course take into account the views expressed in this report. I have no information to show that there has been any increase this year in the number of cases where milk has been rejected because the butter fat content fell below 3 per cent.

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Horses

Mr. Dodds (May 3rd) asked the Minister of Agriculture what is the present population of horses; and how this compares with 1938.

The Minister of Agriculture (Mr. Thomas Williams): The number of horses on agricultural holdings in the United Kingdom at June, 1950, was 549,000 compared with 1,100,000 in June, 1938. Of these, 396,000 were used for agricultural purposes in 1950 and 748,000 in 1938.

Mr. Dodds: Does not my right hon. Friend think that, at the present rate, in ten years from now, the horse will be almost as scarce as the hansom cab is to-day? Will he do something about it?

Mr. Williams: Perhaps my hon. Friend is not aware that, quite recently, the Ministry completed a film showing the work that can be done on a farm by a horse as an auxiliary to a tractor.

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Swine Fever

Mr. Baker (May 2nd) asked the Minister of Agriculture if he will consider introducing compensation for the loss of pigs from swine fever.

Mr. T. Williams: No. The principle embodied in the Diseases of Animals Act is that compensation is payable only in respect of animals slaughtered by order of the Minister; and I do not consider that it would be desirable to alter this policy. It is not the practice to order the slaughter of animals affected, or suspected to be affected with swine fever since it has been found by experience that a slaughter policy is not effective in eradicating this disease. Consequently compensation is not generally payable. A small number of pigs are, however, slaughtered by my veterinary officers for diagnostic purposes and for these compensation is paid on the basis laid down in the Act.

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Colonial Development Corporation (Report)

Mr. Fisher (May 2nd) asked the Secretary of State for the Colonies what action he proposes to take following the criticisms of the former management revealed in the Annual Report of the Colonial Development Corporation.

Mr. J. Griffiths: Matters of management are the responsibility of the Corporation, who are, as the Report indicates, overhauling their organisation with a view to the elimination of the shortcomings of which admission is made.

Mr. Fisher: If the right hon. Gentleman accepts responsibility for the veracity of this Report, which I presume he does, does he not consider that some of the facts revealed in it reflect very seriously on the mismanagement of public funds by the former Chairman? Does the right hon. Gentleman propose to take any action?

Mr. Griffiths: I have referred the hon. Member to the Report itself, which contains proposals for the reorganisation of the Corporation. This is a subject which cannot be discussed by question and answer. Presumably we shall at some time have an opportunity of discussing it in the House.

Mr. Walter Fletcher: Does not the right hon. Gentleman realise that the responsibility was not only that of the Chairman but of the directors, and does he propose making any changes in the Board, for whose appointment he is responsible?

Mr. Griffiths: That is another question.

Gambia (Poultry Scheme)

Mr. Hurd (May 2nd) asked the Secretary of State for the Colonies if a decision has yet been reached about the future of the Colonial Development Corporation's poultry project in the Gambia.

Mr. J. Griffiths: No, Sir, but the Corporation expect to be able to inform me of their proposals in the near future.

Mr. Hurd: As nearly three months have passed since the right hon. Gentleman told us that this scheme would have to be radically overhauled, can he at least give the House an assurance that the trading loss, which was £123,000 last year, is not running on to-day?

Mr. Griffiths: That is another question. The hon. Member asked whether I had yet received the report from the Board and I said I had not, but I expect to receive the Corporation's proposals in the near future.

Mr. R. A. Butler: Is the right hon. Gentleman aware that the Question asks whether a decision has been reached, not whether he has received a report? The House wants to know whether a decision has been reached?

Mr. Griffiths: I said "No, Sir." That is the answer I gave.

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Dogs (Sheep Worrying)

Mr. Maudling (May 3rd) asked the Minister of Agriculture whether he is aware of the losses suffered by farmers in Hertfordshire as a result of the worrying of sheep by dogs; and what steps he proposes to take to mitigate this nuisance.

Mr. T. Williams: Cases of the worrying of sheep by dogs in several parts of the country have been brought to my notice recently. The whole question of sheep worrying is constantly before my Department, but I am afraid that it is not possible to formulate additions to existing arrangements that would have a material effect on the problem without bearing unduly heavily on the great majority of dog owners whose dogs do no damage.

Mr. Maudling: In view of the fact that many farmers have been forced by this nuisance to give up keeping sheep, will the Minister consider whether any strengthening of existing legislation may not have the effect of mitigating the evil?

Mr. Williams: I do not think it is quite so much a question of legislation as of the effective carrying out of existing legislation. I can assure the hon. Member that the county branches of the National Farmers' Union, and the N.F.U. itself, are in close contact with chief constables in all the various counties.

Major Sir Thomas Dugdale: Does not the Minister realise that this menace is becoming very serious indeed, and is a threat to increased production?

Mr. Williams: I am fully aware that it is a very serious problem, but I am glad to see that, nasty as it is, it has been on the decline in the last year or two.

THE SECOND VETERINARY CONGRESS OF ZOOTECHNY

The International Federation of Veterinary Societies of Zootechnics will hold its second congress in Madrid from October 21st to 28th, 1951.

The scope of the discussions will be extremely wide, embracing the animal husbandry aspect of the production of meat, wool, poultry and milk, and the problems of animal husbandry, animal reproduction and artificial insemination as they affect the veterinary profession.

A fuller notice will be published in a later issue, but members who are contemplating attending the congress are advised to make early arrangements. The Hon. Secretary of the Congress, to whom enquiries should be addressed, is Professor Dr. Carlos L. de Cuenca, Sociedad Veterinaria de Zootecnia, Apartado 1200, Madrid, Spain.

Most countries are to be represented, and Dr. N. S. Barron will be the Chairman at the fourth session which deals with poultry.

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MORTALITY AMONG STOCK

A knacker has informed a contributor to *The Farmer & Stockbreeder* that he never had so many animals passing through his hands—horses, cattle and sheep. What struck him as most extraordinary was the number of heifers near calving. This he attributed to malnutrition. "Heifers in my district (the contributor continues) mostly run out during the winter and calve in autumn in good condition. Those due to calve in spring would normally be brought indoors about the New Year, but owing to shortage of keep and the high cost of feeding-stuffs most have been left out longer than seems advisable. My informant thought they had had nothing but straw. Farmers are anxious enough to increase numbers, but it is no good running more than they can feed."

NOTES AND NEWS

Diary of Events

May 16th.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Colchester (Red Lion Hotel), 2.15 p.m.

May 16th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Society's House, 1, Wimpole Street, London, W.1, 5 p.m.

May 17th.—Annual General Meeting of the Dumfries and Galloway Division, N.V.M.A., at Dumfries (Station Hotel), 2.15 p.m.

May 18th.—Annual General Meeting of the Welsh Branch, N.V.M.A., at Newtown (Bear Hotel), 2 p.m.

May 19th.—Annual General Meeting of the Society of Women Veterinary Surgeons at the Royal Veterinary College, Camden Town, 2 p.m.

May 23rd.—Meeting of the Technical Development Committee, N.V.M.A., at 36, Gordon Square, London, W.C.1, 10.30 a.m.

May 24th.—Annual General Meeting of the East Midlands Division, N.V.M.A., at Sutton Bonington, 2.15 p.m.

May 24th.—Meeting of the South-Eastern Division, N.V.M.A., at Tunbridge Wells (Mount Ephraim Hotel), 2.30 p.m.

May 25th.—Annual General Meeting of the Society of Practising Veterinary Surgeons, at York (Royal Station Hotel), 2.30 p.m.

May 25th.—Meeting of the Royal Counties Division, N.V.M.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.

June 5th.—Fifth in the series of Almroth Wright Lectures. The Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, W.2: R. Lovell, D.Sc., M.R.C.V.S. (Royal Veterinary College), "Infection and Resistance in Young Animals," 5 p.m.

June 6th.—108th Annual General Meeting of the Royal College of Veterinary Surgeons at 10, Red Lion Square, London, W.C.1, 12 noon.

June 6th.—Annual General Meeting of the Victoria Veterinary Benevolent Fund, at 10, Red Lion Square, London, W.C.1—immediately following the above.

June 6th, 7th and 8th.—Meetings of Committees and Council, R.C.V.S., at 10, Red Lion Square, London, W.C.1.

Sept. 23rd-29th.—Sixty-ninth Annual General Meeting and Congress of the National Veterinary Medical Association, at Eastbourne.

R.C.V.S. Examinations

Tuesday, May 15th.—Pharmacology, etc., Examination (Revised Syllabus). Written Examination.

Thursday, May 17th.—Pharmacology, etc., Examination (Revised Syllabus). Orals and Practicals (London and Dublin).

Thursday, June 7th.—D.V.S.M. Written Examinations commence at Edinburgh.

Monday, June 11th.—D.V.S.M. Oral Examinations commence.

Thursday, June 21st.—M.R.C.V.S. Written Examinations.

Friday, June 22nd.—M.R.C.V.S. Written Examinations.

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ROYAL (DICK) VETERINARY COLLEGE

Transfer to the University of Edinburgh

In the House of Commons on Monday last the University of Edinburgh (Royal (Dick) Veterinary College) Order Confirmation Bill was read the third time and passed. Effect thus has been given to the terms of the agreement entered into between the administrative board of the College and the University Court for embodying the College within the University, dissolving the board, and transferring the heritable and moveable assets and endowments of the College to the University Court. Details of provisions to be made by the Court "in order to provide for the embodiment of the College within the University and for the better provision of veterinary studies therein" were given in our issue of January 20th, at page 46.

R.C.V.S. OBITUARY

Mr. J. H. Taylor, M.C., F.R.C.V.S.

Former Mayor of Darlington

Mr. James Harry Taylor, of Thornton, Abbey Road, Darlington, whose death at the age of 82 years we recorded with much regret in our last issue, was a former Mayor of the town and member of the Town Council for eleven years.

Born at Oldham, Mr. Taylor attended Manchester Grammar School, and was later apprenticed to the firm of J. and A. Lawson, veterinary surgeons, of Manchester. After two years he entered the Royal Veterinary College, London, and attained the diploma of membership of the Royal College of Veterinary Surgeons in 1891. After qualifying he returned to Manchester, and went to Darlington in 1895.

In conjunction with the late Mr. W. N. Dobbings, Mr. Taylor succeeded to the veterinary practice of the late Mr. F. R. Stevens, whose premises were on the site of Bainbridge Barker's shop in Skinnergate.

He stayed there until 1915, when he volunteered for the Army, going out to France as veterinary officer to the 21st Heavy Brigade, R.G.A., holding the rank of lieutenant. In November of the same year he was appointed officer commanding the mobile veterinary section of the 4th Division. In 1916 he was promoted captain, and shortly afterwards Deputy Assistant Director of Veterinary Services with the rank of major. He was awarded the M.C.

After the Armistice, Mr. Taylor was with the Rhineland Army of Occupation in Cologne and elsewhere. He held the appointment of Deputy Assistant Director of Veterinary Services with the Lowlands Division, and was transferred to Silesia with the British forces during the disturbances in 1921. In autumn of that year he was demobilised, but after an illness was advised not to resume his veterinary practice.

He returned to Darlington and was elected to the Town Council in 1930 to represent South Ward. He remained on the Council representing this ward until he retired in 1941. He and Mrs. Taylor were Mayor and Mayoress in 1937-38.

Mr. Taylor was actively connected with a number of committees within and outside the Town Council, including the Health, Streets, Markets and Fairs, Old Age Pensions, Public Assistance, Prudhoe Hall Colony, Welfare of Afflicted Persons, Darlington Blind Society and Darlington Insurance Society. He was a Past-President of the Friendly Societies Division of the St. John's Ambulance Brigade and a former Treasurer of the Old People's Christmas Parcel Fund. He was prominently associated with the local Conservative Association.

A member of St. Cuthbert's Church, he had been a member of the "Four and Twenty" since 1913, being the oldest member. He was also a former warden. He was a member of the Marquess of Ripon Lodge of Freemasons. Mr. Taylor leaves a widow, to whom deep sympathy is extended in her bereavement.

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PERSONAL

Births.—Hawkins.—On May 4th, 1951, to Joy and Derek Hawkins, of Chichester, a son.

O'Sullivan.—On May 5th, 1951, at St. Francis' Nursing Home, to Theresa, wife of James G. O'Sullivan, M.R.C.V.S., of Glasgow, a son.

Wood.—On April 27th, 1951, at the Royal Cornwall Infirmary, to Barbara, wife of D. R. Wood, M.R.C.V.S., a son—Douglas Jonathan.

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Marriages.—Overton—Storr.—On May 2nd, 1951, at St. John's, Bromsgrove, by the Rev. F. G. Shepherd, Michael, only son of Mr. and the late Mrs. George Overton and the stepson of Mrs. P. Overton, to Elizabeth Margaret, eldest daughter of Mr. and Mrs. H. M. Storr, both of Bromsgrove.

Smith—Hill.—On April 24th, 1951, at Corpus Christi Church, Weston-super-Mare, Basil Smith, B.V.Sc. (Liv.), M.R.C.V.S., P.O. Box 103, Huntly, New Zealand, to Shirley Doris Hill, Dargaville, New Zealand.

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Will.—Dr. John Share Jones, of Bryn Offa, Wrexham, and formerly of Pentrebychan Hall, near Wrexham, a former President of the Royal College of Veterinary Surgeons, Emeritus Professor of Liverpool University, left £13,292 (net value £13,145).

Opening of the Festival of Britain

After months of preparatory work on the main exhibition on the South Bank site, His Majesty the King, broadcasting to the world from the steps of St. Paul's Cathedral on Thursday of last week, inaugurated the nation-wide Festival of Britain, held to mark the centenary of the Great Exhibition of 1851, and which, according to present arrangements, will close on September 30th.

Once it became known that, as is their wont where matters of national prestige are concerned, their Majesties were at the head of Festival affairs, the British people forsook any hesitancy arising from doubts as to the appropriateness of such a venture in these troublous times, and threw themselves with the thoroughness of our race into what they now conceive to be their duty of making a success of it. The people, indeed, are taking the Festival into their own hands all over the country: criticism is giving way to action and throughout the land British history, culture, science, industry and recreation will be there, in their manifold aspects, for all to see.

Doubtless the main streams of pilgrimage will be to Lambeth and Battersea. The main exhibition is sited on 27½ acres of land, most of which had become derelict because of Nazi bombing during the war, on the South bank of the Thames between the Waterloo and Westminster bridges. The buildings—only one of which, the Concert Hall, is of a permanent character—have been designed, according to their function, by able architects and intelligent showmen. Advance publicity has ensured that by now their features and content are largely familiar to all, but the impression left by a tour of the Exhibition on the great occasion of the visit paid by the King and Queen on Friday, May 4th, is of a virile nation, proud of its accomplishment. Of special interest to our readers will be the Commonwealth Agriculture Section in the Dome of Discovery, featuring pest control and tropical medicine—including measures against the tsetse fly, locust invasion, sleeping sickness and leprosy—the substantial building near-by titled "Country," which first takes a look at the wild life of Britain and then leads to agriculture and rural life of to-day, with modern methods of breeding plants and animals. In this part of the Exhibition full use is made of livestock and crops which will change as the season advances. A pavilion titled "Health" has both a popular and specialised medical interest: it deals, among many other matters, with the latest research on the nervous system.

On the same day Lord Addison opened the exhibition of science, in the Science Museum, South Kensington, designed to illustrate the growth of our understanding of the nature and structure of matter. Other major exhibitions will be held in Edinburgh, Glasgow and Belfast, but visitors to London may well wish to see the Exhibition of National Sports Trophies at Hutchinson House, Stratford Place, W.; also—the ladies particularly—the most comprehensive collection of the historic gold and silver plate of the City of London ever assembled, to be viewed in Goldsmiths' Hall, Foster Lane, E.C., until June 16th.

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Bloat in Cattle

Bloat or hoven in cattle is a problem which causes concern to farmers, especially at this time of the year. The actual cause has not been definitely established, but investigations are being made to find out the cause and to discover methods of prevention. There are some indications that certain types of pasture are more liable to produce bloat in cattle than are others and that even on pastures on which bloat is known to occur, the condition is found only at certain times of the year. Because of the lack of precise information about the connection between certain pastures and the occurrence of bloat, farmers are asked to report cases whenever they occur. The investigation is being carried out by the Ministry of Agriculture and Fisheries and all reports received from farmers will be fully investigated by officers of the Department. In order that there should be no avoidable delay, farmers are asked to communicate with the Ministry's Divisional Veterinary Officer in their district whenever a case is found, who will, at once, arrange for the investigation to be made.

It must be stressed that this investigation must not in any way cause farmers to refrain from consulting their veterinary surgeon on the treatment of affected cattle. The work has been arranged for the purpose of increasing our knowledge of the cause and prevention of bloat: the farmer's veterinary surgeon should be called in as usual to treat affected animals and to give whatever advice is necessary.

It is hoped that farmers will give every assistance with this work by first of all notifying the Ministry's Divisional Veterinary Officer as soon as possible of the occurrence of the bloat among their cattle.

LEGAL NOTES

The Supplementary Veterinary Register: An Appeal Allowed

In the King's Bench Division of the High Court, on April 20th, the court—the Lord Chief Justice, Mr. Justice Oliver and Mr. Justice Cassels—allowed the appeal of Miss Marion Eleanor Almond against the refusal of the Council of the Royal College of Veterinary Surgeons to grant her application for registration in the Supplementary Veterinary Register, the application being made on the grounds that she had been doing the work required by the Veterinary Surgeons Act, 1948, at the R.S.P.C.A. Clinic, Birmingham, for 13 years prior to the date of her application.

[On the evidence submitted by her referees the Council was not satisfied that she had met the requirements of the Act. When she appealed to the High Court, she put forward numerous affidavits, including those of veterinary surgeons, to the effect that she had carried out the requisite work. This evidence in these affidavits was not before the Council, R.C.V.S., when making its decision, and under the Act the Council had no power to obtain such sworn affidavits.]

Judgment

The Lord Chief Justice: This is an appeal by Miss Almond against the refusal of the Royal College of Veterinary Surgeons to place her name upon the Supplementary Register of that College. The Supplementary Register is provided for by the Act of 1948, which gave the Veterinary College considerable powers, and this is no doubt a power to be exercised with considerable discretion and care, because it enables people who have not passed qualifying examinations but whose experience is their real qualification, to be placed on the College Register if they fulfil certain defined conditions.

Unfortunately the Act is very silent upon how these people who apply should be admitted, or how the Council should deal with applications which are made; and if this case has any advantage beyond the particular advantage to Miss Almond, it would be that it may call the attention of the appropriate authorities to the fact that it is very desirable that there should be some method appointed for the hearing of these applications in some reasonably formal manner. Whether that can be done without amending the Act of Parliament it is unnecessary for me to discuss at the present time, and I do not propose to do so. I can only say that although there is a rule-making power given in the Act in the sense that if regulations are made they have to be approved by the Privy Council, and apparently the Privy Council have power to at any rate prescribe the form, the Act seems somewhat silent; I have not been able to find anything as to matters in respect of which the Council legislate by regulation.

The section with which we are concerned is this: "The Registrar of the Royal College of Veterinary Surgeons shall keep a separate register, to be known as the Supplementary Veterinary Register, and any person who makes application in that behalf in accordance with the following provisions of this section shall be entitled, subject to the provisions of this section, to be registered in that Register if he satisfies the conditions specified in the next following sub-section." He is to be entitled if he satisfies the conditions. Then it goes on and says: "The conditions for registration in the Supplementary Veterinary Register are that the applicant has attained the age of 28 and satisfies the Council of the Royal College of Veterinary Surgeons—(*a*) that he is of good personal character; (*b*) that during the ten years immediately preceding the application he has for a period of not less than seven years in the aggregate been engaged in the United Kingdom as his principal means of livelihood in diagnosing diseases of animals and giving medical or surgical treatment to animals." Then it is provided that the treatment that is referred to in the First Schedule to the Act, which I may call more or less domestic treatment, shall not qualify a person, that is to say, if a person has been engaged merely in destruction of animals by painless methods, or doing such things as farmers do, such as castrating or caponising, tailing and docking, or the amputation of dew claws; those things are not to count. As I say, what I call the domestic treatment of animals is not to count. In other words, what the applicant has to satisfy the Council about is that he has been engaged in work which a veterinary surgeon undertakes beyond those matters which, although a veterinary surgeon undertakes them, are very often conveniently done by the owner of animals or by a shopkeeper who deals in animals' requisites, as they are sometimes called.

Then there is a provision that "Where the Council refuse an application for registration under this section made within the time limited by or under the last foregoing subsection, they shall state the reason for the refusal and the applicant may in accordance with rules of court appeal to the High Court, and the High

Court may confirm or reverse the decision of the Council." It is now, as it seems to me, that a very unsatisfactory state of affairs arises from certain points of view, and I desire to say at once that I am not attaching blame to the Council, because the Council are not told in the Act what they are to do or how they are to do it. The only thing that is said is that an application for registration must be in the prescribed form, accompanied by a fee of a guinea, and the Privy Council have approved the form which I suppose the Council prescribed. But, of course, it is quite clear that if a person sends in an application and names three referees, the referees may not give information to the Council which satisfies them, and it seems rather hard that the applicant is not told that the referees have not come up to requirements. There is no rule or regulation or provision in the Act for her to be heard, for her to produce people to give evidence in support or to be cross-examined. The importance of it is, of course, that this is dealing with a person's livelihood, because she is saying: "I want to practise and earn my livelihood as a veterinary surgeon; I am applying for this qualification and I say I fulfil these qualifications." One answer is: "You have not satisfied the Council." That may be, but then, it seems to me, if she comes to the High Court, as we are told only that we may affirm or reverse the decision of the Council on her appeal, we have to have such evidence as may be given before us and then, if we are satisfied, we can reverse the Council. In other words, she has to do her best to satisfy us, and no doubt we should always regard it as a somewhat severe onus. But that we have power to consider affidavits and evidence seems to be clear, because these matters are dealt with under Order 59, Rule 28 which provides for appeals under a number of Acts, the Midwives Act, the Nurses Registration Act, the Dentists Act and the Veterinary Surgeons Act. It is provided that "every such appeal shall be supported by affidavit and, if the Court so directs at the hearing, by oral evidence." Therefore, we have nothing else we can consider except the affidavits which are put before us, and affidavits which have been filed in this case by both sides. I am bound to say that I think the lady, in the affidavits filed not only by her but by Mr. Davies, the Secretary of the Royal Society for the Prevention of Cruelty to Animals, by whom she had been employed at Birmingham, and also Mr. Soloman de Montfort Woodward, the veterinary surgeon employed by the Society at Birmingham, makes out a very strong case. She has also filed an affidavit by one of the patrons of the clinic, who tells us of one instance where she took her black cross bitch to this clinic and that Miss Almond diagnosed and cured the complaint from which the animal was suffering and which no other veterinary surgeon had succeeded in diagnosing. It was brought to her, she diagnosed the complaint and cured it. There is also evidence that she has performed herself large numbers of operations and setting of fractures and so forth. The fact that she has been head nurse and that in the proper way she submitted her work to a veterinary surgeon does not seem to me to show that she was not carrying out her work, any more than a house surgeon at a hospital is working all the time under the visiting physicians. The fact that he may be afterwards submitting the work to the honorary consultants who go to the hospital—that used to be so, but not now—does not go to show that he is not a doctor or a surgeon.

I cannot help feeling that if this evidence had been before the Council they might very well have taken a different view, but whether they would have taken a different view or not, this Court has taken the view that we ought to allow this appeal. It is unfortunate that there are not more provisions made in the Act or in any regulations, and if regulations are possible—about which the Council would be well advised to take advice—it would be desirable to make regulations with regard to the hearing of these applications. I dare say most of them are finished now, because the applications had to be made within a certain time, I think more than a year ago, and I dare say there are not many more. The only thing I can say with regard to the Council is that I think it is perhaps unfortunate that they received a letter from the Society for the Prevention of Cruelty to Animals in which they stated that it was not their policy that the attendants, or assistants, or whatever one likes to call them, at their clinics should become veterinary surgeons. But that is neither here nor there. It is not a question as to whether that Society or any other society require or like their employees getting on to the Supplementary Register. The person has to show that he or she has the qualifications for admitting her. It is true that the references she supplied were certainly very half-hearted; in fact, one of them—I do not know why she gave his name—wrote and said he thought she must be under some misapprehension, because he did not know her work; but she was not given the opportunity of giving the name of any other person.

I do not want in this case to attach blame to the Council, because I think they are put in a difficult position owing to the lack of direction given in the Statute and the lack of there being any regulations on the matter, if it is possible to make them, as to which it is not for me to give an opinion.

The Court has come to the conclusion, having read and considered the whole of the evidence placed before it, that we think there is enough to allow the appeal, and it is accordingly allowed.

Mr. Justice Oliver: I share my Lord's sympathy with the Council of the College, who no doubt have done their best, with complete honesty, to fulfil their duties under this section, but it does seem to me a useful suggestion, as the Statute leaves them as masters of their own proceedings, in so far as there are any more applications to be considered that they should take advantage of what this Court has pointed out in this case and another case last week and, at all events in cases which they consider doubtful, or cases where they are minded not to register, to have such a hearing as will enable them to come to some form of judicial conclusion about the matter. That will solve, it seems to me, many of their difficulties and as many of the difficulties of this Court.

Mr. Justice Cassels: I agree.

Mr. J. C. Kekwick (Counsel for the Appellant): Then will the appropriate order be in the terms of subsection 1 of section 6 of the Act, that the Appellant be registered on the Supplementary Register?

The Lord Chief Justice: Yes, we reverse the decision of the Council and direct that her name be placed on the Supplementary Register.

Mr. Kekwick: Then the appeal is allowed with costs?

The Lord Chief Justice: How can we allow costs in this case? In the first place it is against the tribunal. The second thing is that we have decided on entirely different evidence.

Mr. Kekwick: It is a Legal Aid case.

The Lord Chief Justice: If it is a Legal Aid case you can have your costs taxed as between solicitor and client, but we shall not order the Council to pay costs.

Mr. Kekwick: If your Lordship pleases.

Mr. Justice Oliver: If your tackle had been in order before the registering authority you would very likely have got registered.

Mr. Kekwick: Yes, my Lord.

Mr. Justice Cassels: You might have.

The Lord Chief Justice: We cannot give costs, but you can have your costs taxed.

Mr. Kekwick: If your Lordship pleases.

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Since the above case was decided in the Divisional Court, two further appeals against refusal of registration have been heard. In both these appeals the Lord Chief Justice did not call upon the Counsel for the Royal College to argue, as the Court was satisfied, after having heard the appellant only, that there were no grounds on which the decision of the Council should be reversed.

These cases will also be reported.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Swine Fever:

Cumberland.—Schoose Farm, Workington (May 4th).

Lanarks.—Braehead Piggery, Bargeddie, Glasgow (April 30th).

Lancs.—Catchers Farm, Rochdale, Lancs; Nab Gate Farm, Harwood, Turton, Lancs (May 5th); Siddall Farm, Birch, Heywood (May 3rd); "Oak Bank," Mill Lane, Goosnaugh, Preston (May 4th).

Lincs (Holland).—Mole Drove, Gedneyhill, Spalding (May 4th).

Midlothian.—No. 9 Holding, Wester Hailes, Slateford, Edinburgh (May 4th).

Norfolk.—Westcaister Piggeries, Caister-on-Sea, Gt. Yarmouth (May 2nd); Wood Farm, Runhall, Norwich; Sunset Farm, Carleton Rode, Norwich (May 4th).

Somerset.—Hill Farm, Buckland St. Mary, Chard (April 30th).

Staffs.—Butterton Grange Farm, Butterton, Newcastle (May 4th).

Suffolk (E.).—Shrublands Farm, Badingham, Woodbridge (May 4th).

Yorks (E.R.).—Rose and Crown Farm, Fridaythorpe, Malton (May 1st).

Yorks (W.R.).—7, Potter Hill, High Green, Sheffield; Brown Hurst Farm, Ovenden Wood, Halifax (May 4th).

MILK MARKETING BOARD'S A.I. SERVICE

Rise in Conception Rates

Mr. Joseph Edwards, head of the Production Division of the Milk Marketing Board, reported to the fourth annual conference of A.I. chairmen recently held at Thames Ditton that the membership had now reached 70,966 compared with 53,908 in 1949-50, while the number of cows inseminated had risen from 431,370 to 567,102. The largest centre was Carmarthen—probably the largest A.I. centre in the U.K.—with 9,300 members and 65,000 cows inseminated. Other large units were: Tarporley, Cheshire (4,100 members and 41,800 cows inseminated); and Cheswardine, Shropshire (4,500 members and 40,600 cows inseminated).

The impact of A.I. on the cattle population of the areas in which the service was now available could be seen by comparing the number of cows inseminated with the total population. For example, in Norfolk and Suffolk the Beccles Centre inseminated 40 cows out of every 100. In Cornwall and East Devon, the Praze and Honiton Clyst Centres—started less than three years ago—inseminated nearly 45 per cent. of the cows in their areas. The figures were: Praze, 34,224, and Honiton Clyst, 19,343. If the work done by non-Board centres was included, it was a fair estimate that not less than 25 per cent. of the cattle in the country were now being bred by A.I.

The most gratifying feature, said Mr. Edwards, was the all-round improvement in conception rates, which this year were 67·4 per cent. compared with 64 per cent. last year.

Centre Group Conception Rates, 1949 and 1950

Centre	1950 C.R.	1949 C.R.	Centre	1950 C.R.	1949 C.R.
Beccles	68·1	66·2	Shincliffe ...	69·8	62·0
Burley-in-Wharfedale	67·5	62·8	Sturminster Newton	65·8	66·3
Buxton	68·7	66·1	Sutton Bonington ...	67·0	61·0
Carmarthen ...	67·5	55·8	Tarporley	70·3	68·9
Cheswardine ...	70·1	68·6	Tean	67·9	67·1
Chippenham ...	62·6	61·5	Torrington ...	70·8	65·5
Gloucester	64·7	63·7	Welshpool ...	70·8	70·2
Honiton Clyst ...	69·7	68·4	Whalley	67·9	68·3
Kirton*	60·4	65·1	Whiligh	58·6	55·6
Little Horwood ...	69·3	64·2	Writtle	63·4	65·2
Llangefni† ...	66·2	61·8			
Penrith	72·4	71·8	Over-all ...	67·4	64·0
Praze	66·9	64·7			

* Transferred to Sutton Bonington from April, 1950.
† Previously Glynllifon.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

BONE FRACTURES IN EQUINES

Sir,—Major Hamilton Kirk has instigated a discussion on the above subject through your correspondence columns.

I have been unfortunate enough either to destroy, or sanction the destruction of over 100 racehorses during the past 15 years, as the result of accidents involving fractures occurring whilst at work or racing.

I admire the humane motives which have prompted Major Hamilton Kirk in appealing to our profession, and I applaud Mr. Shuttleworth's very sensible article pointing out the possibilities and impossibilities of treating such conditions.

Whilst admitting that where there is a faint chance of effecting a cure sufficient to restore the animal to his former usefulness, the effort should be made (*e.g.*, a split pastern in a two year old), there are several points I would like to raise:—

1. There are many racecourses in this country. Who is to finance the availability of a suitable ambulance for dealing with such cases warranting an attempt at bone repair? On Bank Holidays as many as nine race meetings may be held at the same time, while accidents occur daily in the hunting field.

2. Under the present-day terms of insurance, an owner is justified in having his animal destroyed when a limb has been fractured. Has Major Hamilton Kirk gained the interest of Insurance underwriters, who appear to be the only people capable of financing the work he suggests?

3. Supposing the repair of a factured limb had been successfully accomplished without undue pain and suffering, what chance has the horse of again being fit to function as before? Unless very well bred their stud value would be negligible in the case of colts, and problematical in the case of fillies or mares.

4. Finally it must, I think, be admitted that any attempt at repair must be carried out while the patient is under a general anaesthetic and in a recumbent position. What effect will his struggles to regain his feet have on the plating or pinning suggested?

In the last letter published by Major Hamilton Kirk he refers to a long-lasting anaesthetic being administered to tide the animal over the time occupied whilst being conveyed from the site of accident to the hospital. I would be grateful if he would inform us what anaesthetic he has in mind, as it could be of help to many of us.

Yours faithfully,
A. E. Carey Foster.

The Hermitage,
Church Street,
Epsom.
May 2nd, 1951.

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THE ECONOMICS OF VETERINARY PRACTICE

Sir,—Certain of your correspondents have advocated the preparation of a scheme of National Health Service for Animals, as an insurance against possible financial insecurity in the future.

Unless they are in favour of a scheme for its own sake, their reasoning appears to me to be illogical. If the economy of the country collapses to the extent they suggest, how can any Government be expected to accept another expensive health scheme, and where would they find the money to pay for it if they did accept it?

I agree that there are financial problems to be faced in practice to-day, but I submit that we are by no means the worst off of the professions; and that nationalisation is not a "cure-all" as some people seem to think. In fact I consider it the reverse in most cases.

If, on the other hand, the idea of your correspondents is to have a scheme ready for some future Government, when national economy permits, then the sooner something is said against it the better. My knowledge of the inner workings of the Health Scheme convinces me that, under a national scheme, we would get unnecessary visits to farms and queues at the door for tonic pills whenever a pet shed its coat! To be worked to death seems a high price to pay for so-called financial stability, especially when much of the extra work would not classify as Medicine or Surgery.

Let us not now prepare schemes for nationalisation on whatever pretext they are advocated. Some future Government might be only too delighted to put them into effect!

Yours faithfully,
H. M. Payne.

"Brookhurst,"
Cornard Road,
Sudbury,
Suffolk
April 29th, 1951.

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Erratum.—We regret that, owing to a misunderstanding, the last paragraph of the letter on the subject of fowl paralysis, from Dr. W. M. McKay, on page 338 of our last issue, appeared in a form which is not acceptable to, and is disclaimed by, the writer.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
April 1st to 15th 1951	22	—	12	—	—	38
Corresponding period in—						
1950	12	—	8	—	1	—
1949	7	2	17	—	—	—
1948	6	—	6	—	—	4
Jan. 1st to Apr. 15th, 1951	168	17	451	—	4	248
Corresponding period in—						
1950	138	12	60	—	19	1
1949	48	11	140	—	26	4
1948	35	—	155	1	21	11

* Excluding outbreaks in Army Horses.

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period January 1st to March 31st, 1951, was 1,125.